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Jasko Musacfeendic

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EXAMINER

STEELE, JENNIFER A

ART UNIT

PAPER NUMBER

1798

NOTIFICATION DATE

DELIVERY MODE

02/15/2012

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/596,847 | MUSAEFENDIC, JASKO | |
| | Examiner | Art Unit | |
| | JENNIFER STEELE | 1798 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/9/2012.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 61-73 and 81 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 61-73 and 81 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-302) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Claim Objections

1. Claims 62, 63, 67, 71-73 and 81 are objected to because of the following informalities: The status identifiers indicate the claims to be (Original) when they should be identified as (Previously Presented). These claims were not the originally filed claims. Appropriate correction is required.

Declarations

2. The three Declarations under 37 CFR 1.132 filed on 1/9/2012 are insufficient to overcome the rejection of claims 61-73 and 81 based upon Calfee in view of Brookhart and Hollis, Sr., Calfee in view of Chavannes and Hollis, Sr. and Calfee in view of Meyer and Hollis, Sr. as set forth in the last Office action because: For a Rule 1.132 Declaration to be sufficient to overcome the rejections over prior art, the declarations must be (1) commensurate in scope with the claims and (2) compared to the prior art of record.

The first declaration provided by Dr. Dejan Stevanovic provides evidence that the expanded mesh geometry is a monolithic 3D structure created by cutting and plastically deforming a flat sheet of metal and every single mesh opening is a pyramid-like structure that is interlinked with adjacent openings. While the prior art does not teach this structure produced by this method, the claims to an "expanded mesh" do not limit the structure to that which is provided in the declaration. In addition, the specification did not originally disclose expanded mesh or expanded metal which has this specific structure and is produced by this method. Applicant is limited to subject matter which

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was originally disclosed. Further, the dependent claim 66 claims that the dissipating element is made from various metals as well as polymers, foam and wood so the claims do not limit the invention to the aluminum or metal evidenced in the declaration.

The first declaration continues to discuss the structure of the laminate where there are laminated skins of the outer layers, fibre reinforced inner plies. Claim 61 does not recite fibre reinforced plies.

The Stevanovic declaration provides evidence that under impact there are dynamic and static failure events where the failure is illustrated in Fig. 4 where the laminate was subjected to a bending load in the standard 3-point bend fixture. The declaration states that it can be seen that the laminate skins did not fail during the test, apart from minor damage on the compression side. It is not clear from the figure what damage the declaration is referring to. The declaration continues to describe Fig. 5 which illustrates that once the crack bridges the gap between two mesh openings, it continues along the mesh until it reaches the peak of the mesh 3D profile where it joins with another crack. The "kinked" crack path formation slowed down the whole failure process and allowed the laminate to achieve large deformation levels without any sign of catastrophic failure. It is not clear from Fig. 5 where the crack path is. And while the crack path is slowed at large deformation levels (as stated in the declaration), this statement is relative and does not disclose what the impact force is and does not compare the invention to prior art laminates of Calfee in view of Brookhart and Hollis, Sr., Calfee in view of Chavannes and Hollis, Sr. and Calfee in view of Meyer and Hollis, Sr. Therefore, the evidence is not sufficient to show unexpected results.

The second declaration written by Z.H. Stachurski defines impact strength and the characteristics of a high impact strength material or component. The unexpected results are stated to be impact energy absorbed by ELACO (the invention) composite material is two to three times greater than that of the other materials as shown in Figure 1. The materials in Figure 1 include aluminum, honeycomb, a sheet, ELACO 1, as well as items that can not be read due to poor resolution of the copy, including two other ELACO products. As noted above, in order for evidence to be persuasive, the evidence must be commensurate in scope with the claims and compared to prior art of record. The evidence must also clearly describe the detailed structure of the embodiments and not refer to the invention generally. While the impact strength of the ELACO products is greater than aluminum and honeycomb, Applicant has not compared the ELACO products to the prior art combination of features taught in Calfee, Brookhart and Hollis, Sr., Calfee, Chavannes and Hollis, Sr. and Calfee, Meyer and Hollis, Sr. Applicant has not presented evidence of unexpected results over the prior art of record.

The third declaration written by Denis David Stevens states that the ELACO technology translates the orthogonal surface impact loads into longitudinal loads within the composite structure and these longitudinal loads are distributed by the fibers in the composite fabric. The spaces between the metal in the mesh provide a pathway for the resin in the composite to bond the fabrics on both sides of the mesh together thereby improving the ability to dissipate the orthogonal loads. Despite the various surface treatments designed to improve adhesion between the metal sheet and the composite resins, continuous or perforated sheet metal would not provide the required load

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dissipation. The declaration does not provide quantitative evidence that is commensurate in scope with the claims and which is compared to the prior art of record and therefore the declaration is not persuasive.

Specification

3. Applicant cancelled the amendment to the specification and the previous Objection to the Specification is withdrawn. The amendment to the specification was objected under 35 USC 132(a) because it introduced new matter into the disclosure.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 61 and dependent claims 62-73 and 81 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 61 and 65 recite an "expanded mesh". The specification amendment which disclosed an expanded mesh was cancelled as a result of an Objection under 35 USC 132(a) because it introduced new matter into the disclosure. The claims were not similarly amended to reflect the cancellation of new subject matter and therefore the claim

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limitation "expanded mesh" was not originally disclosed and is new subject matter. The specification discloses expanded metal and ornamesh and these structures are not equivalent to expanded mesh. Expanded mesh is broader in scope than expanded metal and ornamesh.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

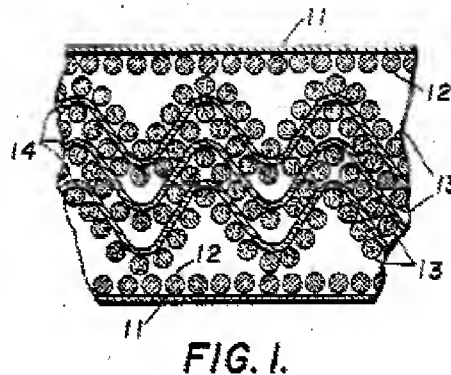
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 61-64 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calfee (US 3,755,059) and Brookhart (US 3,989,789) and Hollis, Sr. (US 3,969,563). Claim 61 describes a high impact strength, elastic laminate system for enhancing impact resistant properties of a laminate structure, said laminate system comprising:

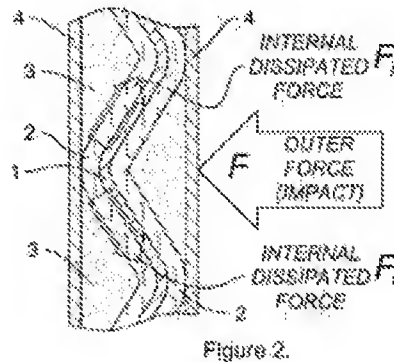
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- a first outer layer
- a second outer layer
- at least two inner plies placed between the first and second outer layers;
- at least one dissipating element placed between said inner plies adapted to dissipate and redirect randomly directed local loading applied to at least one of said two outer layers, to tensile loading directed in longitudinal direction of said inner plies; and
 - whereby the said dissipating elements are structures presented in form selected from the group: of expanded mesh; woven mesh.
- a polymer matrix in between said first and second layer and said first and second plies,
 - said polymer matrix arranged to occupy all the volume not taken up by, and inbetween the said two outer layers, said at least two inner plies and said at least one dissipating element.

Calfee teaches a laminar composite of high impact and shearing resistance comprised of layers of graphite fiber, glass fiber and corrugated metal foil in an arrangement which resists spalling, interlaminar shearing and multipoint failure due to shock wave transmission (ABST). Calfee's laminate is shown in Fig. 1 below where **11** is a metal foil layer and equated with Applicant's outer layers, **12** is a layer of glass fibers and equated with Applicant's inner plies, **13** are graphite fiber layers and equated with Applicant's inner plies and **14** are corrugated metal foil layers and equated with Applicant's dissipating elements.



Calfee Fig. 1



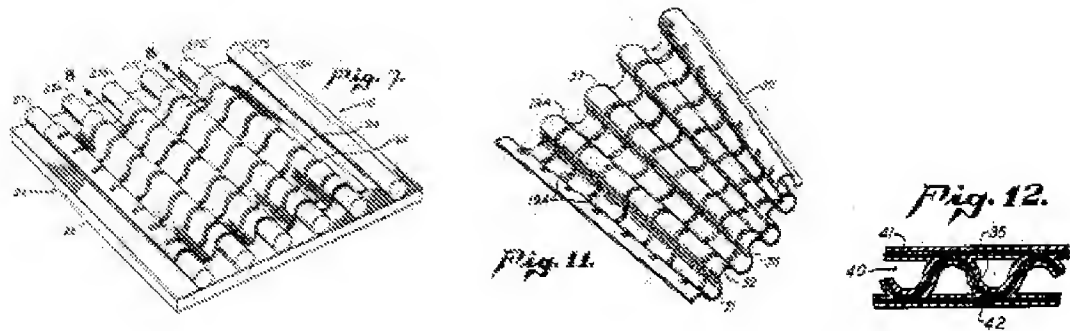
Applicant's Fig. 2

Calfee differs and does not teach the corrugated metal foil layers are in the form of an expanded mesh or woven mesh.

Brookhart is directed to a woven cloth of flexible material is formed over spaced supports which is cured to harden in sinusoidal shape. The woven cloth is warped, bent or otherwise shaped as desired for application to it of laminar sheets of cloth, wood or metal, then the core and the laminates are joined, impregnated and cured to a rigid structure of desired configuration and high strength to weight ratio (ABST). As shown in Figures. 7, 11 and 12, the woven cloth is shaped into a sinusoidal shape and cured and then can form a laminate structure such as that in Fig. 12. The cloth is an industrial

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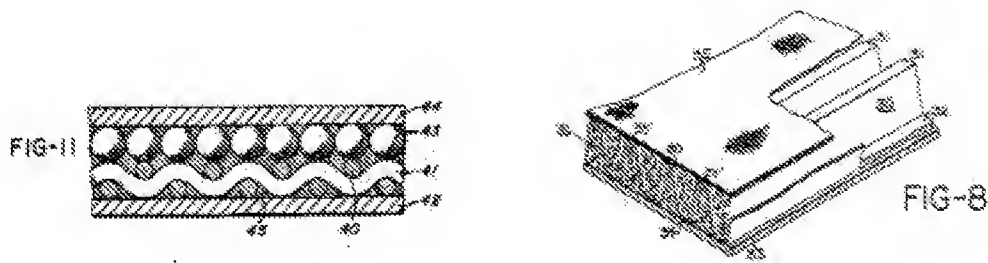
woven cloth such as fiberglass, carbon cloth or other cloths of high strength, permeability and flexibility (col. 2, lines 33-36).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the corrugated woven cloth of Brookhart for the corrugated sheet of Calfee motivated to produce a laminate with the strength that corrugated mesh wires provide.

Calfee and Brookhart differ from the current application and do not teach a polymer matrix arranged to occupy all the volume not taken up by the layers.

Hollis teaches a protective wall structure that resists penetration and impact. Hollis teaches outer layers of multilayer cloth with at least one inner protective inner layer defined by a rib-like formation defining a series of pockets (ABST). The pockets are filled with a self sealing core structure such void filling adhesive such as epoxy-urethane elastomer (col. 10, lines 25-29). The epoxy-urethane elastomer is equated with Applicant's polymer matrix. The structure of Hollis is shown in embodiments in Fig. 11 and Fig. 8 below.



It would have been obvious to employ the polymer resin filled pockets of Hollis in the high impact laminate of Calfee and Chavannes motivated to increase the strength of the composite laminate.

As to claim 62, Calfee teaches additional layers of inner plies and dissipating elements.

As to claim 63, Calfee teaches the function of the inner plies is to serve as reinforcement. Calfee teaches that the glass fiber plies provide greater impact strength and therefore provide an improved laminate if the glass fibers are placed are located on the impact side (col. 2, lines 46-66).

As to claim 64, Calfee teaches the plies are made from S-glass, E-glass fibers (col. 3, lines 23-25).

As to claim 81, Calfee differs and does not teach a woven mesh layer. Brookhart teaches a woven cloth can be formed into a sinusoidal shape and produced into a laminate which provides structural strength. Brookhart teaches a woven cloth but is silent with respect to the weave of the woven fabric. In the absence of a disclosure, one of ordinary skill in the art would equate a woven cloth with a plain weave. As shown in the figures of Brookhart, the weave is shown as a plain weave with an even

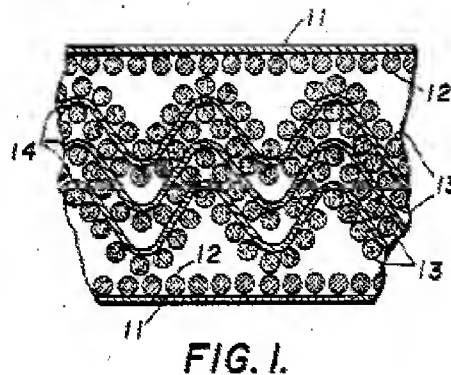
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pattern of warps and wefts. Brookhart's cloth allows for a polymer matrix to flow through the weave and cure into a rigid and strong form.

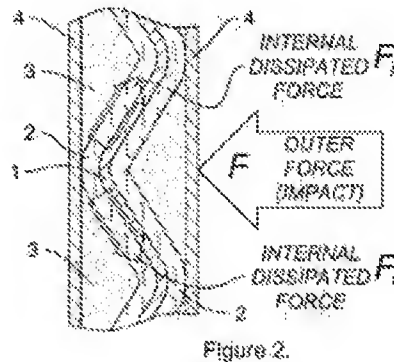
It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a plain woven fabric motivated to produce a laminate with improved structural strength and one which allows a polymer matrix to flow through.

2. Claims 61-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calfee (US 3,755,059) and Chavannes (US 4,358,498) and in further view of Hollis, Sr. (US 3,969,563).

Calfee teaches a laminar composite of high impact and shearing resistance comprised of layers of graphite fiber, glass fiber and corrugated metal foil in an arrangement which resists spalling, interlaminar shearing and multipoint failure due to shock wave transmission (ABST). Calfee's laminate is show in Fig. 1 below where **11** is a metal foil layer and equated with Applicant's outer layers, **12** is a layer of glass fibers and equated with Applicant's inner plies, **13** are graphite fiber layers and equated with Applicant's inner plies and **14** are corrugated metal foil layers and equated with Applicant's dissipating elements.



Calfee Fig. 1



Applicant's Fig. 2

Calfee differs and does not teach the corrugated metal foil layers are in the form of a mesh.

Chavannes is directed to a reinforced laminated and corrugated board-like structure which includes a corrugated layer with reinforcing wire elements (ABST). The invention is an improved corrugated material formed of relatively stiff corrugated, plastic covered wire reinforcing elements with paper and/or plastic webs or liners adhered to one or both sides of the corrugated structure. The reinforcing elements may be either coated with a plastic or embedded in a sheet containing plastic in the form of longitudinal and/or transverse elements secured in spaced relationship to form a structure affording strength in the finished material (col. 1, lines 28-45). Chavannes

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teaches the wires form a grid as shown in Fig. 11B and are then fed through corrugating rollers to form a corrugated grid. The corrugated grid is then covered with a first and second plastic film such as shown in the structure in Fig. 12A and Fig. 10B. Chavannes teaches a corrugated mesh sheet is used to strengthen a laminate sheet.



Chavannes differs and does not teach the mesh is expanded mesh, however expanded mesh is a process limitation where the mesh is formed by expanding the sheet to form holes. It would have been obvious to employ an expanded mesh versus welded mesh of Chavannes. It should be noted that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or an obvious variant from a product of the prior art, the claim is unpatentable even though a different process made the prior product. In re Thorpe, 227 USPQ 964,966 (Fed. Cir. 1985). The burden has been shifted to the Applicant to show unobvious differences between the claimed product and the prior art product. In re Marosi, 218 USPQ 289,292 (Fed. Cir. 1983).

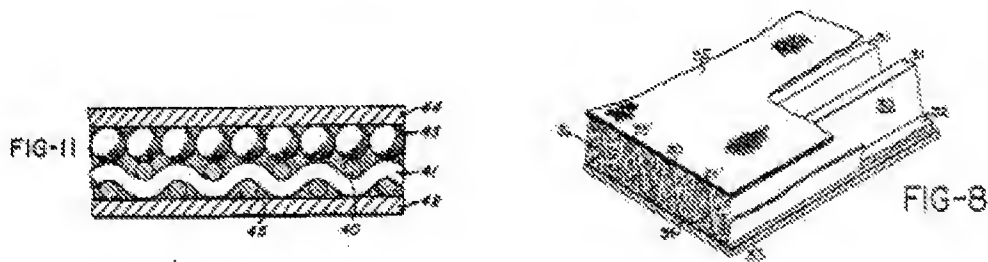
It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the corrugated mesh of Chavannes for the corrugated

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sheet of Calfee motivated to produce a laminate with the strength that corrugated mesh wires provide.

Calfee differs from the current application and does not teach a polymer matrix arranged to occupy all the volume not taken up by the layers.

Hollis teaches a protective wall structure that resists penetration and impact. Hollis teaches outer layers of multilayer cloth with at least one inner protective inner layer defined by a rib-like formation defining a series of pockets (ABST). The pockets are filled with a self sealing core structure such void filling adhesive such as epoxy-urethane elastomer (col. 10, lines 25-29). The epoxy-urethane elastomer is equated with Applicant's polymer matrix. The structure of Hollis is shown in embodiments in Fig. 11 and Fig. 8 below.



It would have been obvious to employ the polymer resin filled pockets of Hollis in the high impact laminate of Calfee and Chavannes motivated to increase the strength of the composite laminate.

As to claim 62, Calfee teaches additional layers of inner plies and dissipating elements.

As to claim 63, Calfee teaches the function of the inner plies is to serve as reinforcement. Calfee teaches that the glass fiber plies provide greater impact strength and therefore provide an improved laminate if the glass fibers are placed are located on the impact side (col. 2, lines 46-66).

As to claim 64, Calfee teaches the plies are made from S-glass, E-glass fibers (col. 3, lines 23-25).

As to claim 65, Calfee differs and does not teach expanded mesh.

Chavannes teaches a metal mesh. While Chavannes differs and does not teach the mesh is expanded mesh, expanded mesh is a process limitation where the mesh is formed by expanding the sheet to form holes. As the structure of expanded mesh and the mesh of Chavannes are obvious variants of a metal mesh, it would have been obvious to employ an expanded mesh versus welded mesh of Chavannes. It should be noted that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or an obvious variant from a product of the prior art, the claim is unpatentable even though a different process made the prior product. In re Thorpe, 227 USPQ 964,966 (Fed. Cir. 1985). The burden has been shifted to the Applicant to show unobvious differences between the claimed product and the prior art product. In re Marosi, 218 USPQ 289,292 (Fed. Cir. 1983).

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As to claim 66, Calfee differs and does not teach expanded mesh. Calfee teaches the metal foil is preferably made from a metal such as aluminum ,beryllium, magnesium, nickel, steel or titanium (col. 3, lines 20-23).

Chavannes teaches a metal wire mesh comprised of steel, aluminum, alloys (col. 4, lines 15-25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ steel or aluminum alloys motivated to improve the strength of the dissipating elements.

As to claim 67, Calfee teaches at least two dissipating ply elements and reinforcing fibrous plies. Calfee teaches the fibrous plies can have fiber orientations of 0 or 90 degree (Table 2) which would be a unidirectional or cross-ply orientation as claimed. Calfee teaches the effect on fiber orientation is minimal (col. 5, lines 1-11).

As to claim 68, Calfee teaches the fibrous plies are impregnated with an epoxy resin (col. 3, lines 46). Calfee differs and does not teach a polymer matrix between the inner plies and outer faces. Hollis teaches the polymer matrix which fills the voids can be of a epoxy-urethane elastomer (col. 10, lines 25-28).

As to claim 69, Calfee teaches the outer metal layers can be made from aluminum ,beryllium, magnesium, nickel, steel or titanium (col. 3, lines 20-23).

As to claim 70, Calfee differs and does not teach an additional layer on the outer layers of the composite laminate. Hollis teaches outer layers of multilayered cloth that can be aluminized (col. 7, lines 45-51). It would have been obvious to one of ordinary

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skill in the art to add additional outer layers motivated to improve the strength of the laminate and provide the desired outer surface.

As to claims 71 and 72, Calfee in view of Chavannes and Hollis are all directed to impact resistant structures and therefore it is reasonable to presume that the claimed properties would be inherent or obvious over the combination. Calfee teaches the laminate can absorb impacts of lesser weights than claimed. When the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention the examiner has basis for shifting the burden of proof to applicant as in *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112- 2112.02

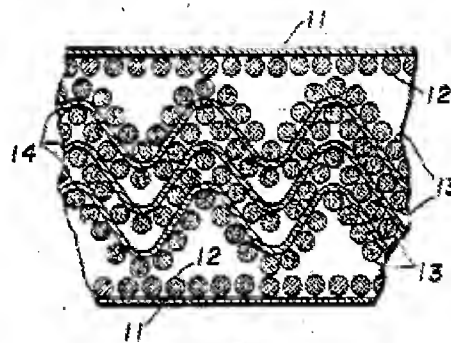
As to claim 73, Calfee and Chavannes and Hollis differ and do not teach the density of the laminate. It would have been obvious to one of ordinary skill in the art to optimize the layer thickness and number of layers motivated to produce a laminate with the desired impact resistance.

3. Claims 61-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calfee (US 3,755,059) and Meyer (US 2,733,177) and in further view of Hollis, Sr. (US 3,969,563).

Calfee teaches a laminar composite of high impact and shearing resistance comprised of layers of graphite fiber, glass fiber and corrugated metal foil in an arrangement which resists spalling, interlaminar shearing and multipoint failure due to shock wave

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transmission (ABST). Calfee's laminate is show in Fig. 1 below where **11** is a metal foil layer and equated with Applicant's outer layers, **12** is a layer of glass fibers and equated with Applicant's inner plies, **13** are graphite fiber layers and equated with Applicant's inner plies and **14** are corrugated metal foil layers and equated with Applicant's dissipating elements.



Calfee Fig. 1

FIG. 1.

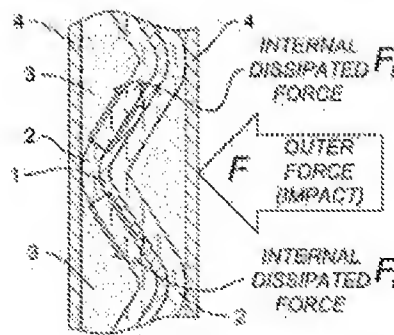


Figure 2.

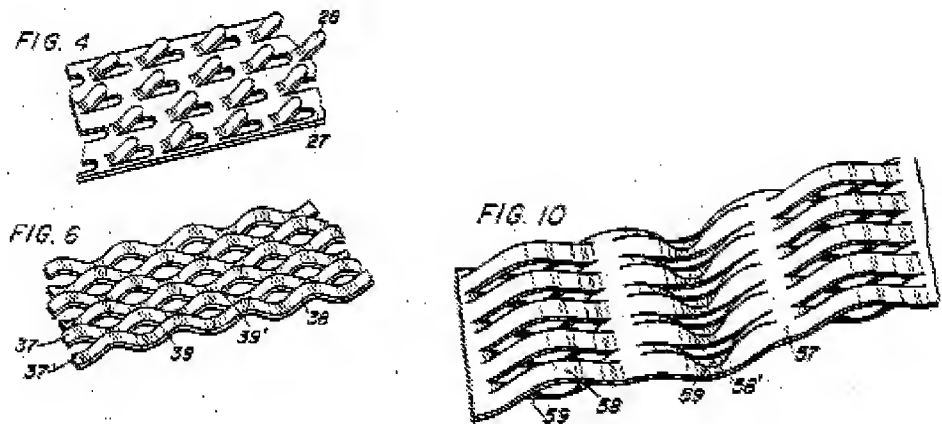
Applicant's Fig. 2

Calfee differs and does not teach the corrugated metal foil layers are in the form of an expanded mesh or woven mesh.

Meyer is directed to an elastic cascading impact absorber. Meyer teaches multiple layers including three rigid plates, 1, 3, and 5 laminated thereinbetween and attached thereto three elastic layers, 2, 4 and 6 adapted to elastically support and

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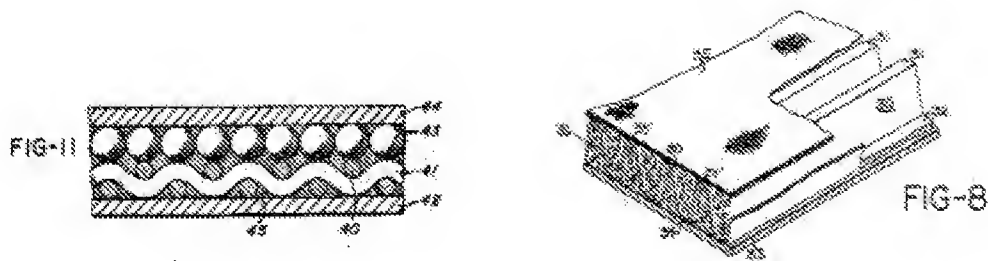
separate layers 1, 3 and 5 as shown in Fig. 1 below. The layers may be attached to each other by means of adhesives or welding or a combination of both. Layer 1 is composed of rigid plates such as plate 7 which may be composed of metal or glass-fabric reinforced plastic. Sheet 12 may be an elastic material such as steel having a spring constant selected so that the plates of layer 1 will compress springs 12 stamped out from sheet 12. Meyer does not refer to the elastic material sheets as expanded mesh, the elastic sheets have openings that resemble a mesh structure such as that shown in Fig. 4, 6 or 10. And the elastic sheets of Meyer are formed by stamping the openings into the metal sheet. The claimed expanded mesh sheets are obvious over Meyer's mesh structure. The method of forming the sheets, expanding or stamping is a product by process limitation. It should be noted that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or an obvious variant from a product of the prior art, the claim is unpatentable even though a different process made the prior product. In *re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). The burden has been shifted to the Applicant to show unobvious differences between the claimed product and the prior art product. In *re Marosi*, 218 USPQ 289,292 (Fed. Cir. 1983).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the corrugated mesh of Meyer for the corrugated sheet of Calfee motivated to produce a laminate with the strength that corrugated mesh wires provide.

Calfee and Meyer differ from the current application and do not teach a polymer matrix arranged to occupy all the volume not taken up by the layers.

Hollis teaches a protective wall structure that resists penetration and impact. Hollis teaches outer layers of multilayer cloth with at least one inner protective inner layer defined by a rib-like formation defining a series of pockets (ABST). The pockets are filled with a self sealing core structure such void filling adhesive such as epoxy-urethane elastomer (col. 10, lines 25-29). The epoxy-urethane elastomer is equated with Applicant's polymer matrix. The structure of Hollis is shown in embodiments in Fig. 11 and Fig. 8 below.



As to claims 61 and 65, it would have been obvious to employ the polymer resin filled pockets of Hollis in the high impact laminate of Calfee and Meyer motivated to increase the strength of the composite laminate.

As to claim 62, Calfee teaches additional layers of inner plies and dissipating elements.

As to claim 63, Calfee teaches the function of the inner plies is to serve as reinforcement. Calfee teaches that the glass fiber plies provide greater impact strength and therefore provide an improved laminate if the glass fibers are placed are located on the impact side (col. 2, lines 46-66).

As to claim 64, Calfee teaches the plies are made from S-glass, E-glass fibers (col. 3, lines 23-25).

As to claim 66, Calfee teaches the metal foil is preferably made from a metal such as aluminum ,beryllium, magnesium, nickel, steel or titanium (col. 3, lines 20-23). Calfee differs and does not teach an expanded mesh dissipating element. Meyer teaches a metal mesh structure which is formed of steel (col. 2, lines 40-41).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the sheets out of steel motivated to achieve the desired laminate strength which steel provides.

As to claim 67, Calfee teaches at least two dissipating ply elements and reinforcing fibrous plies. Calfee teaches the fibrous plies can have fiber orientations of 0 or 90 degree (Table 2) which would be a unidirectional or cross-ply orientation as claimed. Calfee teaches the effect on fiber orientation is minimal (col. 5, lines 1-11). Meyer teaches multiple plies of elastic metal. It would have been obvious to one of ordinary skill in the art to employ multiple plies of dissipating elements motivated to improve the impact strength of the laminate.

As to claim 68, Calfee teaches the fibrous plies are impregnated with an epoxy resin (col. 3, lines 46). Calfee differs and does not teach a polymer matrix between the inner plies and outer faces. Hollis teaches the polymer matrix which fills the voids can be of an epoxy-urethane elastomer (col. 10, lines 25-28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ an epoxy resin motivated to improve the impact strength of the laminate.

As to claim 69, Calfee teaches the outer metal layers can be made from aluminum, beryllium, magnesium, nickel, steel or titanium (col. 3, lines 20-23).

As to claim 70, Calfee differs and does not teach an additional layer on the outer layers of the composite laminate. Hollis teaches outer layers of multilayered cloth that can be aluminized (col. 7, lines 45-51). It would have been obvious to one of ordinary

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skill in the art to add additional outer layers motivated to improve the strength of the laminate and provide the desired outer surface.

As to claims 71 and 72, Calfee in view of Meyer and Hollis are all directed to impact resistant structures and therefore it is reasonable to presume that the claimed properties would be inherent or obvious over the combination. Calfee teaches the laminate can absorb impacts of lesser weights than claimed. When the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention the examiner has basis for shifting the burden of proof to applicant as in *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112- 2112.02

As to claim 73, Calfee and Meyer and Hollis differ and do not teach the density of the laminate. It would have been obvious to one of ordinary skill in the art to optimize the layer thickness and number of layers motivated to produce a laminate with the desired impact resistance.

Response to Arguments

4. Applicant's amendment cancelling the amendment to the specification has been fully considered and is persuasive. The Objection to the Specification has been withdrawn. In view of the cancellation of the amendment the claim structure of expanded mesh is now rejected under 35 USC 112 1st paragraph as expanded mesh is subject matter that was not described in the specification in such a way as to

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reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

5. Applicant's arguments filed 1/9/2012 have been fully considered but they are not persuasive. The response to the three Rule 1.132 Declarations is detailed above. The declarations are not commensurate in scope with the claims and do not provide evidence of unexpected results over the prior art of record. The declarations are insufficient to overcome the rejections. Applicant argues that the declarations provide evidence that an expanded mesh provides an improvement over prior art and unexpected results based on a combination of features. While the first declaration by Dr. Stevanovic indicates that the invention's expanded mesh is a material that is different from a wire mesh, the specification does not provide support for this specific structure. The specification teaches dissipating elements can be any metal and non-metal structures (expanded metal, ornamech, rigidized metal, corrugated sheet, tube, balls, and any other similar forms, aluminum foam or other metallic foam-like structure) having the function of dissipation and redirection of local active loading (impact) applied to at least one of the two outer faces, to longitudinal (tensile) reactive loading in fibre reinforcement-inner plies. The specification does not detail the structure of the expanded metal. Further, claim 61 claims an expanded mesh or a woven mesh and dependent claim 66 recites that the dissipating elements can be made from any number of materials including wood, foams, polymers and plastics. These materials are not be equated with the expanded mesh detailed by Dr. Stevanovic's declaration. If the declaration did provide evidence of unexpected results with the expanded mesh shown

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and described in the declaration, the original disclosure did not specify this structure.

The dissipating elements taught in the specification do not describe the expanded mesh described in the declarations. Applicant's arguments are directed to the Rule 1.132

Declarations and are not persuasive. The rejections are maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER STEELE whose telephone number is (571)272-7115. The examiner can normally be reached on Office Hours Mon-Fri 8AM-5PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer Steele/
Primary Examiner, Art Unit 1798